UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte DAVID CHEUNG, JOE FENG, JUDY H. HUANG, and WAI-FAN YU

Appeal No. 2005-1118
Application No. 09/418,818

ON BRIEF

Before OWENS, TIMM, and JEFFERY T. SMITH, *Administrative Patent Judges.*

TIMM, *Administrative Patent Judge.*

DECISION ON APPEAL

This appeal involves claims 1-6, 9, 10, and 44-62 which are all the claims pending in the application. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 134.

INTRODUCTION

The invention relates to an apparatus for depositing an antireflective layer onto a semiconductor wafer by plasma-enhanced chemical vapor deposition (PECVD). Computer readable program code controls the processing so that the antireflective layer is formed to a specified thickness. Claim 1 is illustrative of the subject matter on appeal:

1. A substrate processing system, comprising:
a vacuum chamber;
a substrate supporter, located within the vacuum chamber, for holding a substrate;
a gas manifold for introducing process gases into the chamber;
a gas distribution system, coupled to the gas manifold, for distributing the process gases to the gas manifold from gas sources;
a power supply coupled to the gas manifold;
a vacuum system for controlling pressure within the vacuum chamber;
a controller, including a computer, for controlling the gas distribution system, the power supply and the vacuum system; and
a memory coupled to the controller comprising a computer readable medium having a computer readable program code embodied therein for directing operation of the substrate processing system, the computer readable program code including:
computer readable program code for causing the gas distribution system to introduce a first process gas comprising a mixture of SiH_4 and N_20 into the chamber to deposit a first plasma enhanced CVD layer over the wafer;
computer readable program code for causing the gas distribution system to introduce a second process gas comprising He into the chamber to control the deposition rate of the first layer; and
computer readable program code for controlling the gas distribution system to operate for a specified time period and for causing the first plasma enhanced CVD layer to be formed to a thickness which is an odd multiple, greater than one, of a wavelength of light to be used in a subsequent process operation on the layer.

The claims are rejected under 35 U.S.C. § 103(a). The Examiner relies upon the following prior art references as evidence of obviousness:

Felts et al. (Felts '199)	4,888,199	Dec. 19, 1989
Lee	5,286,581	Feb. 15, 1994
Collins et al.	5,300,460	Apr. 5, 1994
Felts et al. (Felts '665)	5,364,665	Nov. 15, 1994

Batey, et al. (Batey), *Low-temperature deposition of high-quality silicon dioxide by plasma-enhanced chemical vapor deposition*, Vol. 60 (9), J. Appl. Phys., pp. 3136-3145 (1986)

The specific rejections maintained by the Examiner are:

1. Claims 1-6, 9, 10, 44-50, 53-57, and 62 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Felts '199 in view of Batey and Lee;

2. Claim 51 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Felts '199 in view of Batey and Lee and further in view of Felts '665;

3. Claims 52, 58, and 59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Felts '199 in view of Batey and Lee and further in view of Collins;

4. Claims 60 and 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Batey in view of Lee.

We reverse with regard to the rejection of claims 1-6, 9, 10, and 44-54. With respect to the rejection of claims 55-62, we find that these rejections are not ripe for review and we, therefore, remand the application for further action. Our reasons follow.

OPINION

Turning first to claims 1-6, 9, 10, and 44-54, we note that these claims require, within the context of the claimed PECVD system, a computer readable program code or computer instructions for controlling the gas distribution system to operate for a specified time period and for causing a layer or film to be formed to a thickness which is an odd multiple, greater than one, of a wavelength of light to be used in a subsequent process operation of the layer or film.

The Examiner cites Felt '199 as describing a PECVD system which includes a computerized control system. The Examiner acknowledges that Felts '199 does not describe computer instructions for thickness control as required by the claims and turns to Lee. What Lee describes is control of layer thickness according to a mathematical formula such that the thickness, in the words of Appellants' claims, is a thickness which is an odd multiple equal to one of the claimed wavelength, it is not an odd multiple, greater than one, of the claimed wavelength. The Examiner appears to acknowledge that Lee does not contain the required thickness disclosure, by concluding that "it would have been obvious to one of ordinary skill in the art at the time the invention was made *to realize* that odd multiples of radians is the same phase angle." (Final Rejection, p. 6). But even if one of ordinary skill in the art would have come to that realization, the Examiner has not provided evidence of a reason, suggestion, or motivation within the prior art to form a thicker layer than that disclosed in Lee. Nor has the Examiner provided evidence that one of ordinary skill in the art would have modified the

computer instructions of Felts '199 to cause the layer to be formed to a thickness that is an odd multiple, greater than one, of the wavelength as claimed.

The references to Batey, Felts '665, and Collins, as applied by the Examiner, do not remedy the deficiencies discussed above.

The examiner bears the initial burden of presenting a *prima facie* case of unpatentability. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). In this case the evidence upon which the conclusion of obviousness is based falls short of establishing a *prima facie* case of unpatentability with respect to the subject matter of claims 1-6, 9, 10, and 44-54.

Turning to claims 55-62, we find that the record is not ripe for review of the rejections of these claims. Claims 55-62 include "means for ..." recitations. Because these limitations are expressed in "means plus function" language and because they do not recite definite structure in support of the recited function, they are subject to the requirements of 35 U.S.C. §112, ¶ 6. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424, 43 USPQ2d 1896, 1899 (Fed. Cir. 1997). Accordingly, an examiner must interpret the claims containing such limitations in accordance with 35 U.S.C. § 112, ¶ 6. *In re Donaldson Co.*, 16 F.3d 1189, 1195, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994)(*en banc*). In particular, 35 U.S.C. § 112, ¶ 6 requires that the claims be "construed to cover the corresponding structure ... described in the in the specification and equivalents thereof." We note that issues of conformance with 35 U.S.C. § 112, ¶¶ 1 and 2 go hand-in-hand with the § 112, ¶ 6 analysis: Where the identity of the corresponding structure cannot be determined from the specification, there are questions of whether the written

description complies with 35 U.S.C. § 112, ¶ 1 and whether applicant has particularly pointed out and distinctly claimed the invention in compliance with 35 U.S.C. § 112, ¶ 2. *Id.*; *In re Dossel*, 115 F.3d 942, 42 USPQ2d 1881 (Fed. Cir. 1997). The appropriate analysis under the law must be placed on the record in sufficient detail to allow an appropriate review of the Examiner's action with respect to the affected claims. For this purpose, we remand the application for action not inconsistent with the law discussed above.

CONCLUSION

To summarize, the decision of the Examiner to reject claims 1-6, 9, 10, and 44-54 under 35 U.S.C. § 103(a) is reversed. We further find that the rejections of claims 55-62 are not ripe for review and, therefore, the application is remanded to the Examiner for action not inconsistent with the law as expressed above.

This remand to the examiner pursuant to 37 CFR § 41.50(a)(1) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)) is made for further consideration of a rejection. Accordingly, 37 CFR § 41.50(a)(2) applies if a supplemental examiner's answer is written in response to this remand by the Board.

REVERSED- IN-PART

and

REMANDED

TERRY J. OWENS Administrative Patent Judge	)
CATHERINE TIMM Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
JEFFERY T. SMITH Administrative Patent Judge	)

CT/jrg

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